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| 10/540,968 | 09/26/2005 | Wei Sun | 046528-5047 (415078) | 6096 |
| 23973 7590 05/29/2009 DRINKER BIDDLE & REATH ATTN: INTELLECTUAL PROPERTY GROUP ONE LOGAN SQUARE 18TH AND CHERRY STREETS PHILADELPHIA, PA 19103-6996 | | | | |
| EXAMINER | | | | |
| JONES, HUGH M | | | | |
| ART UNIT | | PAPER NUMBER | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/540,968

Applicant(s)

SUN ET AL.

Examiner

Hugh Jones

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/5/2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date 10/27/2008
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-10 are pending.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite in that it fails to point out what is included or excluded by the claim language. This is a consequence of the “*or other operations*” recitation. This claim is an omnibus type claim.
4. Claim 3 provides for the use of *patient specific data*, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.
5. Claim 3 is also rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).
6. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. There is no limitation “d” in claim 1. Applicants were advised of this issue in the previous office action but have been silent. It is unclear whether claim 5

is referring to a non-existent limitation "d" of claim 1, that claim 5 is newly introducing limitation "d" or that claim 5 is actually referring to limitation "c" of claim 1.

Claim Interpretation

7. The following interpretations are noted.

- Claim 10: is directed to simultaneously depositing at different locations at the same exact time;

- Claims 5, 7-8 are process claims, not product-by-process claims; they are directed to intended use and therefore are provided no patentable weight.

- Claim 10: "for simultaneously depositing specified hydrogels with different viscosities" refers to intended use – no patentable weight. The claims are directed to a multi-nozzle biopolymer deposition apparatus. "thereby constructing a scaffold from the designed scaffold model" also refers to intended use and is therefore provided no patentable weight.)

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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9. Claims 1-10 are rejected under 35 U.S.C. 102(e) as clearly anticipated by Boland et al. (US 7,051,654).

10. Boland discloses:

1. A process for manufacturing complex parts and devices comprising:

- (a) utilizing a CAD environment to design a part or device to be created and
- (b) converting the CAD designed part or device into a heterogeneous material and multi-part assembly model which can be used for multi-nozzle printing; and

Col. 14:

Using the techniques described above, it has been discovered that cells may be printed onto a substrate and remain viable. However, not only does the present invention provide a mechanism for ensuring cell survival, it also provides the ability to easily, quickly, and inexpensively manipulate the types of patterns, densities, etc., that may be printed. For instance, the printed patterns may be simple or complex, and have a shape that is regular or irregular. In fact, due to the control provided by the present invention, there is essentially no limit on the patterns or shapes capable of being printed according to the present invention.

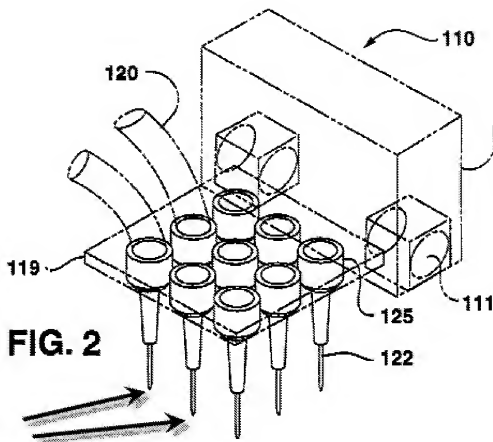
Col. 15:

Regardless of the pattern and/or density selected, the present invention may utilize various control techniques to ensure that the desired results are achieved. Unlike conventional techniques for printing cells that involve contact-deposition, the present invention provides a precise, well-controlled method of printing that does not substantially risk contamination. The non-contact, ink-jet printing techniques employed in the present invention also allow for better control than previously realized when depositing viable cells onto a substrate. Generally speaking, any well-known ink-jet printing control technique may be utilized in the present invention. For instance, a printer driver may be used to control the movement of the printer head, the movement of the substrate, the voltage delivery to the printer head, etc. Some suitable ink-jet printing control techniques that may be adapted for use in the present invention are described in

Referring to FIG. 8, for instance, a block diagram of one embodiment of a control system that may be used in the present invention is shown. As shown, the system includes a host computer 500 and an ink-jet printer 100 (FIG. 1). In the host computer 500, the exchange of various data and control are generally performed between an OS (Operating System) 501 and application software 502 that operates on the OS 501. Print data is exchanged between the OS 501, the application software 502, and a printer driver 503, and is sent to the printer 110 through the printer driver 503. The present invention is by no means limited to any particular printer driver because, as is well known to those skilled in the art, numerous types of printer drivers may accomplish the same functions desired in the present invention.

2 The flow of data in the process of printing out cell composition(s) from the printer 100 is generally described below. Typically, a user first inputs the desired cell density and pattern into the application software 502. These data signals are then sent to the printer driver 503. The printer driver 503 performs processing for the received signals, and also generally converts them into binary signals. The printer driver 503 sends these signals to the interface, in the host computer 500, which is used for the printer 100 or the interface for a file storage unit or the like. The signals are then sent as output to the interface for the printer 100, and the data signals are sent to controller software 601 in the printer 100. Matching between the set print mode and a printer head 110 is checked. Thereafter, the print data is transferred to engine software 602. In this case, the engine software 602 interprets the received data as data indicating the print mode and the data structure designated by the controller software 601, converts the print data into discharge pulses, and sends them to the printer head 110. With this operation, cell composition(s) are discharged from the printer head 110. The ID information of the printer head 110, the ID information of each cell composition reservoir, etc., are sent to the engine software 602. On the basis of these

(c) printing the designed part or device using multiple, different, specialized nozzles.



Col. 4:

15 Generally speaking, any known ink-jet printer and/or ink-jet printing system may be incorporated for use in the present invention. Ink-jet printers are typically either "DOD" (Drop-On-Demand) or "continuous" ink-jet printers. In a continuous ink-jet printer, a stream of fluid con-

40 In addition, various ink-jet printers used to print layers on plastic parts (known as "rapid prototyping") may also be adapted for use in the present invention. One example of such a printer is the ModelMaker II™ printer available from Solidscape, Inc. (formerly "Sanders-Prototype, Inc."). The

Col. 6:

5 In the illustrated embodiment, the deposition portion 133 includes a housing 137 into which a fluid flows. To facilitate deposition accuracy, the housing 137 may have a conical shape so the diameter of the housing 137 is about 4 millimeters at the top portion and about 2 millimeters at the bottom portion. From the housing 137, the fluid then flows to a hollow needle or tube 139. The size of the needle 139 depends on the type of fluid, the substrate, the printing pattern, and other factors. However, it is generally desired that the needle 139 is large enough to allow any particulates to pass therethrough without substantial sticking or clogging, but small enough to provide the desired deposition accuracy. For example, in one embodiment the needle 139 is a 30-gauge needle that allows cells up to about 100 micrometers in diameter to pass therethrough without substantial sticking or clogging. Of course, smaller and larger needles 139 are also contemplated in the present invention. For instance, in some embodiments, cells having diameters of up to several hundred micrometers (e.g., cell aggregates) may be printed in accordance with the present invention.

Col. 15:

Regardless of the pattern and/or density selected, the present invention may utilize various control techniques to ensure that the desired results are achieved. Unlike conventional techniques for printing cells that involve contact-deposition, the present invention provides a precise, well-controlled method of printing that does not substantially risk contamination. The non-contact, ink-jet printing techniques employed in the present invention also allow for better control than previously realized when depositing viable cells onto a substrate. Generally speaking, any well-known ink-jet printing control technique may be utilized in the present invention. For instance, a printer driver may be used to control the movement of the printer head, the movement of the substrate, the voltage delivery to the printer head, etc. Some suitable ink-jet printing control techniques that may be adapted for use in the present invention are described in

Referring to FIG. 8, for instance, a block diagram of one embodiment of a control system that may be used in the present invention is shown. As shown, the system includes a host computer 500 and an ink-jet printer 100 (FIG. 1). In the host computer 500, the exchange of various data and control are generally performed between an OS (Operating System) 501 and application software 502 that operates on the OS 501. Print data is exchanged between the OS 501, the application software 502, and a printer driver 503, and is sent to the printer 110 through the printer driver 503. The present invention is by no means limited to any particular printer driver because, as is well known to those skilled in the art, numerous types of printer drivers may accomplish the same functions desired in the present invention.

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Col. 17:

A modified Canon® Bubble Jet 2100 printer was used to print the bacteria cells onto the coverslip substrate. The Canon® printer was modified by removing the rubber rolls and removing the center springs, and tightening the remaining springs designed to advance paper. 35

Microsoft PowerPoint software was used to edit a linear colony array pattern with a 2 drops per millimeter density and 0.13 pt weight (Microsoft® PowerPoint™). A black ink-jet cartridge was emptied of its contents, thoroughly cleaned with a 100% ethanol solution, rinsed using autoclaved water, and dried in a sterilized hood. Thereafter, the cartridge was filled with 1 milliliter of a bacterial printing suspension. 55

A modified HP® DeskJet 550C printer was used to print the bacteria cells onto the microscope slide substrate. The HP® printer was modified with gear mount pillars having closer tolerances, which was accomplished by adding a horizontal support, changing the transistor in the circuit to one with higher amplification, and re-entering the horizontal position encoder. Both printers utilized a printer driver to allow different viscosities of solutions to be printed. The printer drivers constantly adjusted the voltages to the nozzles to account for different impedances of the solutions, thus allowing the appropriate amount of solution to be dispensed. The printer drivers are available for download at the following website: <http://130.127.152.24>. 40 45 50

2. The process of claim 1 further comprising using Boolean, scaling, smoothing, mirroring, or other operations to modify the CAD design prior to conversion into a heterogeneous material and multi-part assembly model.

Col. 14:

Using the techniques described above, it has been discovered that cells may be printed onto a substrate and remain viable. However, not only does the present invention provide a mechanism for ensuring cell survival, it also provides the ability to easily, quickly, and inexpensively manipulate the types of patterns, densities, etc., that may be printed. For instance, the printed patterns may be simple or complex, and have a shape that is regular or irregular. In fact, due to the control provided by the present invention, there is essentially no limit on the patterns or shapes capable of being printed according to the present invention.

Col. 15:

Referring to FIG. 8, for instance, a block diagram of one embodiment of a control system that may be used in the present invention is shown. As shown, the system includes a host computer 500 and an ink-jet printer 100 (FIG. 1). In the host computer 500, the exchange of various data and control are generally performed between an OS (Operating System) 501 and application software 502 that operates on the OS 501. Print data is exchanged between the OS 501, the application software 502, and a printer driver 503, and is sent to the printer 110 through the printer driver 503. The present invention is by no means limited to any particular printer driver because, as is well known to those skilled in the art, numerous types of printer drivers may accomplish the same functions desired in the present invention.

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3. The process of claim 1 wherein in step (a) data taken from MRI, CT or other patient specific data is imported into the CAD environment to design the part or device to be created. Col. 16:

The techniques for printing viable cells in accordance
55 with the present invention may be employed in a wide
variety of applications. One such application is the forma-
tion of genomic and protein expression libraries. For
instance, these libraries typically require high throughput
screening of thousands of bacteria cells to identify specific
60 DNA sequences, investigate gene expression, and/or search
for differentially expressed genes. Patterns of bacteria cells
may also be printed according to the present invention to
build biosensors, such as to monitor environmental compo-
nents and detect toxicological contamination. In addition,
65 artificial chromosome libraries and other cell-based sensors
may also be formed. The present invention may also be
employed in tissue engineering and even organ production.

4. The process of claim 1 wherein a biomimetic and non-biomimetic feature is designed into the part or device.

(Note that plainly stated biomimetics refers to human-made processes, substances, devices, or systems that imitate nature (mimetic: Late Latin *mimeticus*, from Greek *mimētikos*, from *mimeisthai* to imitate, from *mimos* mime; from Gk. *Bio-*, comb. form of *bios* "life, course or way of living"). The non-biomimetic scaffold is used to grow the biomimetic (cells/organ) portion.)

In this context, see col. 10:

25 ~ ~ ~ Besides gels, other support compounds may also be
utilized in the present invention. Extracellular matrix
analogs, for example, may be combined with support gels to
optimize or functionalize the gel. One or more growth

■ The manner in which the support compound and/or cells may be deposited onto a substrate may generally vary. For instance, FIG. 4 is a schematic illustration of one embodiment in which layers are deposited onto a substrate 216 using the printer 100 of FIG. 1. Initially, the substrate 216 is supplied at an end 211 of the feed mechanism 114 (FIG. 1). The wheels 135 of the feed mechanism 114 rotate clockwise, so that the substrate 216 is moved closer to the printer head 110. After reaching the desired position, the wheels 135 stop so that the printer head 110 is positioned to deposit the fluids at the desired location. In this embodiment, three fluids (the same or different) are supplied from reservoir(s) (not shown) to nozzles 210, 212, and 214 of the printer head 110. The printer head 110 may make multiple passes over the substrate 216. For instance, in one embodiment, the printer head 110 moves back and forth in the -x direction to make multiple passes over the substrate 216 as it rests on the feed

5. The process of claim 1 wherein the part or device comprises a tissue engineering device and printing in step (d) involves direct deposition of cells or biological factors.

(intended use for the process. These are process claims, not product-by-process claims. No patentable weight provided; limitation "d" is not considered in view of the ambiguity and Applicant's silence on this issue. Regardless, Boland teaches both direct and non-direct contact. See title: "Ink-jet printing of viable cells"). Col. 17:

A modified HP® DeskJet 550C printer was used to print the bacteria cells onto the microscope slide substrate. The HP® printer was modified with gear mount pillars having closer tolerances, which was accomplished by adding a horizontal support, changing the transistor in the circuit to one with higher amplification, and re-entering the horizontal position encoder. Both printers utilized a printer driver to allow different viscosities of solutions to be printed. The printer drivers constantly adjusted the voltages to the nozzles to account for different impedances of the solutions, thus allowing the appropriate amount of solution to be dispensed. The printer drivers are available for download at the following website: <http://130.127.152.24>.

Col. 16:

The techniques for printing viable cells in accordance
55 with the present invention may be employed in a wide
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tion of genomic and protein expression libraries. For
instance, these libraries typically require high throughput
screening of thousands of bacteria cells to identify specific
60 DNA sequences, investigate gene expression, and/or search
for differentially expressed genes. Patterns of bacteria cells
may also be printed according to the present invention to
build biosensors, such as to monitor environmental compo-
nents and detect toxicological contamination. In addition,
65 artificial chromosome libraries and other cell-based sensors
may also be formed. The present invention may also be
employed in tissue engineering and even organ production.

Col. 17:

A modified Canon® Bubble Jet 2100 printer was used to
print the bacteria cells onto the coverslip substrate. The
Canon® printer was modified by removing the rubber rolls 35
and removing the center springs, and tightening the remain-
ing springs designed to advance paper.

Boland also discloses that direct contact was standard in the art, and that non-direct has
certain advantages: Col. 15:

Regardless of the pattern and/or density selected, the
present invention may utilize various control techniques to
ensure that the desired results are achieved. Unlike conven- 15
tional techniques for printing cells that involve contact-
deposition, the present invention provides a precise, well-
controlled method of printing that does not substantially risk
contamination. The non-contact, ink-jet printing techniques
employed in the present invention also allow for better 20
control than previously realized when depositing viable cells
onto a substrate. Generally speaking, any well-known ink-jet
printing control technique may be utilized in the present
invention. For instance, a printer driver may be used to
control the movement of the printer head, the movement of 25
the substrate, the voltage delivery to the printer head, etc.
Some suitable ink-jet printing control techniques that may
be adapted for use in the present invention are described in

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6. The process of claim 5 wherein direct cell deposition improves histological accuracy, cell ratios, and spatial patterning of cells in the part or device.

(The limitation is directed to a subjective test and furthermore refers to an intended purpose. However, the consequence appears to be an inherent result of the cause - the direct deposition)

7. The process of claim 1 wherein the part or device produced comprises an artificial organ, a tissue scaffold, an artificial vasculature or channel system, or a sample for cytotoxicity testing.

(intended use for the process. These are process claims, not product-by-process claims. No patentable weight provided).

8. The process of claim 1 wherein the part or device produced comprises a biochip, biosensor, bionic, cybernetic, mechanoactive, or a bioactive tissue scaffold.

(intended use for the process. These are process claims, not product-by-process claims. No patentable weight provided).

9. The process of claim 1 wherein the part or device is used in drug delivery.

(Intended use - no patentable weight provided. The claims are directed to a process for manufacturing complex parts and devices.

10. A multi-nozzle biopolymer deposition apparatus comprising:

(a) a data processing system which processes a designed scaffold model and converts it into a layered process tool path;

(see limitations a, b, of claim 1)

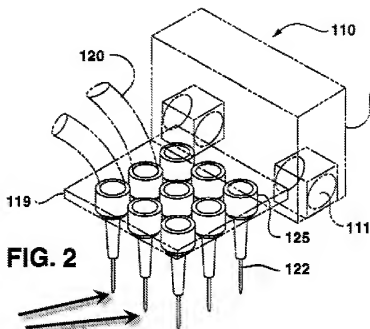
(b) a motion control system driven by the layered process tool path:

(see limitations a, b, of claim 1)

(c) a material delivery system comprising multiple nozzles of different types and sizes for simultaneously depositing specified hydrogels with different viscosities thereby constructing a scaffold from the designed scaffold model.

("for simultaneously depositing specified hydrogels with different viscosities" refers to intended use - no patentable weight. The claims are directed to a multi-nozzle biopolymer deposition apparatus. thereby constructing a scaffold from the designed scaffold model" also refers to intended use and is therefore provided no patentable weight.)

See fig. 2:



Regardless, see Col. 17:

position encoder. Both printers utilized a printer driver to
allow different viscosities of solutions to be printed. The
printer drivers constantly adjusted the voltages to the
nozzles to account for different impedances of the solutions,
thus allowing the appropriate amount of solution to be
dispensed. The printer drivers are available for download at
the following website: <http://130.127.152.24>.

As for scaffolds, see col. 10:

25 ~ ~ Besides gels, other support compounds may also be
utilized in the present invention. Extracellular matrix
analogs, for example, may be combined with support gels to
optimize or functionalize the gel. One or more growth

- The manner in which the support compound and/or cells may be deposited onto a substrate may generally vary. For instance, FIG. 4 is a schematic illustration of one embodiment in which layers are deposited onto a substrate 216 using the printer 100 of FIG. 1. Initially, the substrate 216 is supplied at an end 211 of the feed mechanism 114 (FIG. 1). The wheels 135 of the feed mechanism 114 rotate clockwise, so that the substrate 216 is moved closer to the printer head 110. After reaching the desired position, the wheels 135 stop so that the printer head 110 is positioned to deposit the fluids at the desired location. In this embodiment, three fluids (the same or different) are supplied from reservoir(s) (not shown) to nozzles 210, 212, and 214 of the printer head 110. The printer head 110 may make multiple passes over the substrate 216. For instance, in one embodiment, the printer head 110 moves back and forth in the -x direction to make multiple passes over the substrate 216 as it rests on the feed

Response to Arguments

11. Applicant's arguments, filed 3/5/2009, have been carefully considered and are not persuasive.

.. Applicants argue (112-1, 112-2; pg. 4):

The word "simultaneous" is defined as "existing or occurring at the same time." (see simultaneous. (2009). In *Merriam-Webster Online Dictionary*. Retrieved March 5, 2009, from www.merriam-webster.com/dictionary/simultaneous). The word simultaneous is not used inconsistently with this definition in the specification. Nothing in this definition, or in the use of the term simultaneous, addresses any spatial relationship, as Examiner has asserted it might. The Examiner has not cited any reference or text to support the contention that the term simultaneous in any context says anything at all about any spatial relationship. Applicants respectfully submit that the plain meaning of the term simultaneous is silent with regard to any spatial relationship. Applicants further submit that the term simultaneous, as it is used in claim 10, is unambiguous and is used consistently with its plain meaning to describe a temporal relationship.

The corresponding rejections are withdrawn in view of the arguments and the definition provided by Applicants. Claim 10 is directed to simultaneously depositing at different locations at the same exact time.

12. The rejection over Mironov et al. is withdrawn in view of the Inventor's statement in the affidavit:

6. Mironov et al. is not a proper 35 U.S.C. § 102(a) or § 103(a) reference, because I invented the apparatus, as well as the processes the apparatus performs, before Mironov et al. was published online on February 22, 2003.

7. Prior invention by me of the apparatus is evidenced by the presence of the pictures of the apparatus shown in Figure 2a of Mironov et al. The picture shown in Figure 2a was provided by me to Vladimir Mironov, the lead author of Mironov et al., before Mironov et al. was published online on February 22, 2003.

13. A new prior art rejection is applied.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Landers et al. (of record; IDS of 10/26/2007) discloses:

Desktop manufacturing of complex objects, prototypes and biomedical scaffolds by means of computer-assisted design combined with computer-guided 3D plotting of polymers and reactive oligomers

Biopolymer Landers et al., R01/ Microscopy

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hugh Jones whose telephone number is (571) 272-3781. The examiner can normally be reached on M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571) 272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hugh Jones/
Primary Examiner, Art Unit 2128